

08/917044 04/21/98

FILE 'EPO' ENTERED AT 08:44:16 ON 21 APR 1998

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* * * * *
*           G P I
*   E U R O P E A N   P A T E N T   A B S T R A C T S
* * * * *
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FILE 'JPO' ENTERED AT 08:44:16 ON 21 APR 1998

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* * * * *
*           G P I
*   J A P A N E S E   P A T E N T   A B S T R A C T S
* * * * *
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=> s 111

FILE 'EPO'

```
16068 POST
6524 POSTS
20299 POST
      (POST OR POSTS)
2652 CONSUMER
762 CONSUMERS
3155 CONSUMER
      (CONSUMER OR CONSUMERS)
34 POST CONSUMER
      (POST(W) CONSUMER)
13806 RECYCL?
416 ?VIRGIN
9025 ?PURE
71274 PLASTIC
21894 PLASTICS
90608 PLASTIC
      (PLASTIC OR PLASTICS)
77579 CONTAINER
23682 CONTAINERS
87478 CONTAINER
      (CONTAINER OR CONTAINERS)
8802 BOTTLE
5698 BOTTLES
11736 BOTTLE
      (BOTTLE OR BOTTLES)
256 (POST CONSUMER OR RECYCL? OR ?VIRGIN OR ?PURE) (P) PLASTIC
(P)
      (CONTAINER OR BOTTLE)
18088 CONTAMINA?
4137 MIGRAT?
6570 MULTILAYER?
41748 MULTI
1 MULTIS
41749 MULTI
      (MULTI OR MULTIS)
147148 LAYER?
4738 MULTI LAYER?
      (MULTI(W) LAYER?)
```

41748 MULTI
 1 MULTIS
 41749 MULTI
 (MULTI OR MULTIS)
 147148 LAYER?
 4738 MULTI-LAYER?
 (MULTI (W) LAYER?)
 10572 POLYETHYLENE
 147 POLYETHYLENES
 10642 POLYETHYLENE
 (POLYETHYLENE OR POLYETHYLENES)
 5438 POLYPROPYLENE
 73 POLYPROPYLENES
 5483 POLYPROPYLENE
 (POLYPROPYLENE OR POLYPROPYLENES)
 8919 FLUORIN?
 105 EVOH
 14825 ETHYLENE
 39 ETHYLENES
 14849 ETHYLENE
 (ETHYLENE OR ETHYLENES)
 15940 VINYL
 11 VINYLS
 15950 VINYL
 (VINYL OR VINYLS)
 18438 ALCOHOL
 6030 ALCOHOLS
 22898 ALCOHOL
 (ALCOHOL OR ALCOHOLS)
 308 ETHYLENE VINYL ALCOHOL
 (ETHYLENE (W) VINYL (W) ALCOHOL)
 9 EVAL
 2506 SCRAP
 217 SCRAPS
 2684 SCRAP
 (SCRAP OR SCRAPS)
 3329 TRIM
 218 TRIMS
 3493 TRIM
 (TRIM OR TRIMS)
 L13 0 L6 AND L7 AND L10

FILE 'JPO'

18163 POST
 2686 POSTS
 19739 POST
 (POST OR POSTS)
 562 CONSUMER
 293 CONSUMERS
 820 CONSUMER
 (CONSUMER OR CONSUMERS)
 0 POST CONSUMER
 (POST (W) CONSUMER)
 7694 RECYCL?
 253 ?VIRGIN
 14717 ?PURE
 54082 PLASTIC
 7607 PLASTICS
 59869 PLASTIC
 (PLASTIC OR PLASTICS)
 72245 CONTAINER
 6529 CONTAINERS
 74324 CONTAINER
 (CONTAINER OR CONTAINERS)
 5461 BOTTLE
 1213 BOTTLES

5979 BOTTLE
 (BOTTLE OR BOTTLES)
 50 (POST CONSUMER OR RECYCL? OR ?VIRGIN OR ?PURE) (P) PLASTIC
 (P)
 (CONTAINER OR BOTTLE)
 25047 CONTAMINA?
 5572 MIGRAT?
 22625 MULTILAYER?
 45493 MULTI
 18 MULTIS
 45503 MULTI
 (MULTI OR MULTIS)
 483818 LAYER?
 5800 MULTI LAYER?
 (MULTI (W) LAYER?)
 45493 MULTI
 18 MULTIS
 45503 MULTI
 (MULTI OR MULTIS)
 483818 LAYER?
 5800 MULTI-LAYER?
 (MULTI (W) LAYER?)
 34216 POLYETHYLENE
 125 POLYETHYLENES
 34251 POLYETHYLENE
 (POLYETHYLENE OR POLYETHYLENES)
 14927 POLYPROPYLENE
 34 POLYPROPYLENES
 14936 POLYPROPYLENE
 (POLYPROPYLENE OR POLYPROPYLENES)
 19024 FLUORIN?
 211 EVOH
 1 EVOHS
 211 EVOH
 (EVOH OR EVOHS)
 39525 ETHYLENE
 8 ETHYLENES
 39530 ETHYLENE
 (ETHYLENE OR ETHYLENES)
 46386 VINYL
 39 VINYL
 46405 VINYL
 (VINYL OR VINYL)
 48596 ALCOHOL
 3699 ALCOHOLS
 51194 ALCOHOL
 (ALCOHOL OR ALCOHOLS)
 787 ETHYLENE VINYL ALCOHOL
 (ETHYLENE (W) VINYL (W) ALCOHOL)
 11 EVAL
 2941 SCRAP
 1176 SCRAPS
 3777 SCRAP
 (SCRAP OR SCRAPS)
 3004 TRIM
 236 TRIMS
 3178 TRIM
 (TRIM OR TRIMS)
 L14 0 L6 AND L7 AND L10
 TOTAL FOR ALL FILES
 L15 0 L11

08/917044 04/21/98

=> s 428/421/ccls and plastic (w) (container or bottle)

1290 428/421/CCLS
451774 PLASTIC
111733 PLASTICS
505436 PLASTIC
(PLASTIC OR PLASTICS)
220433 CONTAINER
105597 CONTAINERS
249633 CONTAINER
(CONTAINER OR CONTAINERS)
48679 BOTTLE
30054 BOTTLES
62142 BOTTLE
(BOTTLE OR BOTTLES)
11942 PLASTIC (W) (CONTAINER OR BOTTLE)
L1 19 428/421/CCLS AND PLASTIC (W) (CONTAINER OR BOTTLE)

=> s multilayer? or multi layer? and recycle? and polycontinuous

<-----User Break----->

u
SEARCH ENDED BY USER

=> s multilayer? or multi layer? and recycle? and continuous

32399 MULTILAYER?
215211 MULTI
15 MULTIS
215213 MULTI
(MULTI OR MULTIS)
558868 LAYER?
28356 MULTI LAYER?
(MULTI (W) LAYER?)
75261 RECYCLE?
519587 CONTINUOUS
1 CONTINUOUSES
519588 CONTINUOUS
(CONTINUOUS OR CONTINUOUSES)
L2 32750 MULTILAYER? OR MULTI LAYER? AND RECYCLE? AND CONTINUOUS

=> s l1 and l2

L3 4 L1 AND L2

=> d 1-

1. 5,543,217, Aug. 6, 1996, Amorphous copolymers of tetrafluoroethylene and hexafluoropropylene; Richard A. Morgan, 428/375; 106/38.2, 38.22; 174/110FC; 359/580; 425/436R; **428/421**, 422, 463; 526/247, 250, 253, 254, 255 [IMAGE AVAILABLE]

2. 5,225,257, Jul. 6, 1993, Fluorine treatment of stretch/cling films; Patrick Brant, 428/34.9; 156/244.11; **428/421**, 516, 520, 522; 525/240 [IMAGE AVAILABLE]

3. 4,880,675, Nov. 14, 1989, Hot-fillable **plastic containers**; Rajendra K. Mehta, 428/35.7; 215/12.2, 379, 400; 264/83; 427/230, 236;

428/215, 421, 476.1, 516, 518, 520 [IMAGE AVAILABLE]

4. 4,115,619, Sep. 19, 1978, Highly reflective **multilayer** metal/polymer composites; Virgil B. Kurfman, et al., 428/336, 31, 332, 335, 412, 418, 421, 422, 423.7, 424.8, 425.8, 437, 457, 458, 460, 461, 463, 475.5 [IMAGE AVAILABLE]

=> d 1 ab

US PAT NO: 5,543,217 [IMAGE AVAILABLE]

L3: 1 of 4

ABSTRACT:

Amorphous tetrafluoroethylene copolymers having a hexafluoropropylene content up to 29 mol % with the hexafluoropropylene units being uniformly distributed throughout the copolymer.

=> d kwic

US PAT NO: 5,543,217 [IMAGE AVAILABLE]

L3: 1 of 4

US-CL-CURRENT: 428/375; 106/38.2, 38.22; 174/110FC; 359/580; 425/436R; 428/421, 422, 463; 526/247, 250, 253, 254, 255

SUMMARY:

BSUM(43)

Coatings . . . the amorphous TFE/HFP copolymers of this invention can be a sole coating on a substrate, or a component of a **multilayer** coating. For example, a TFE/HFP copolymer coating of this invention can be used as a first or primer, intermediate, or final coating in a **multilayer** fluoropolymer coating system. The coatings of this invention include coatings resulting from several successive applications of dispersion or solution to. . .

DETDESC:

DETD(14)

Approximately 800 g of the product dispersion was poured into a **plastic bottle** and then placed in a freezer at -20.degree. C. for three days. The bottle of dispersion was then thawed out. . .

=> s 428/903.3/ccls and multilayer? plastic (container or bottle) and polypropylene and polyethylene

MISSING OPERATOR 'PLASTIC (CONTAINER'

=> s 428/903.3/ccls and multilayer? plastic (w)(container or bottle) and polypropylene and polyethylene

274 428/903.3/CCLS
32399 MULTILAYER?
451774 PLASTIC
111733 PLASTICS
505436 PLASTIC
(PLASTIC OR PLASTICS)
293 MULTILAYER? PLASTIC
(MULTILAYER? (W) PLASTIC)
220433 CONTAINER
105597 CONTAINERS
249633 CONTAINER
(CONTAINER OR CONTAINERS)
17 BOTTLE
30 MULTILAYER? PLASTIC (W) (CONTAINER OR BOTTLE)

109439 POLYPROPYLENE
4007 POLYPROPYLENES
110579 POLYPROPYLENE
(POLYPROPYLENE OR POLYPROPYLENES)
200299 POLYETHYLENE
7280 POLYETHYLENES
201543 POLYETHYLENE
(POLYETHYLENE OR POLYETHYLENES)

L4 2 428/903.3/CCLS AND MULTILAYER? PLASTIC (W) (CONTAINER OR BOT
TTL
E) AND POLYPROPYLENE AND POLYETHYLENE

=> d 1-

1. 5,712,009, Jan. 27, 1998, Coextruded **multilayer plastic container** utilizing post consumer plastic; Duane H. Moore, et al., 428/35.7; 206/524.1, 524.6; 215/12.1; 264/454; 428/36.92, 500, 542.8, 903.3; 525/240 [IMAGE AVAILABLE]
2. 3,940,001, Feb. 24, 1976, Recyclable plastic containers; Albert J. Haefner, et al., 215/12.2; 220/460; 229/3.5R; 426/106; 428/2, 35.7, 36.6, 903.3 [IMAGE AVAILABLE]

=> d 1-2 ab

US PAT NO: 5,712,009 [IMAGE AVAILABLE] L4: 1 of 2

ABSTRACT:

A coextruded **multilayer plastic container** utilizing post consumer plastic resin comprising an appearance enhancing thin outer layer of ethylene polymers, which enhances the appearance of the container, an intermediate layer comprising a fusion blend of post consumer resin with or without colorant and a third layer comprising a fusion blend of post consumer resin which may have mixed colors. In a modified and preferred form, a fourth inner layer of virgin ethylene polymer is provided.

US PAT NO: 3,940,001 [IMAGE AVAILABLE] L4: 2 of 2

ABSTRACT:

A recyclable blow molded, injection blow molded or injection molded plastic container having laminated walls that include a frangible load-bearing lamina and a non-frangible fluid-barrier lamina which can be easily separated from each other in a crushing operation and recycled to make another container.

=> d 1 kwic

US PAT NO: 5,712,009 [IMAGE AVAILABLE] L4: 1 of 2

TITLE: Coextruded **multilayer plastic container**
utilizing post consumer plastic

US-CL-CURRENT: 428/35.7; 206/524.1, 524.6; 215/12.1; 264/454; 428/36.92, 500, 542.8, 903.3; 525/240

ABSTRACT:

A coextruded **multilayer plastic container** utilizing post consumer plastic resin comprising an appearance enhancing thin outer layer of ethylene polymers, which enhances the appearance of. . .

SUMMARY:

BSUM(4)

Specifically when containers are made from recycled post consumer high density **polyethylene** homopolymers (HDPE) container scrap, it has been found that the containers have diminished physical properties. Such containers made of high density **polyethylene** homopolymers also have been used for packaging of certain types of liquid detergent products. The use of such containers to. . .

SUMMARY:

BSUM(5)

It has been suggested that such post consumer resin be utilized because large quantities of high density **polyethylene** post consumer resin are available due to the extensive use of high density **polyethylene** in large containers for milk and water. Post consumer resin from such containers contains contaminants of paper and other plastic. . .

SUMMARY:

BSUM(6)

In . . . from a fusion blend of a post consumer resin and ethylene polymers comprising post consumer resin of homopolymer high density **polyethylene** plastic and virgin high density **polyethylene** copolymer resin. The physical properties of the container including stress crack resistance are maintained as contrasted to the loss of. . .

SUMMARY:

BSUM(7)

In accordance with the aforementioned application, pellets of a homopolymer high density **polyethylene** resin from post consumer resin (PCR) and pellets of a virgin high density **polyethylene** copolymer were mixed and fusion blended. Containers were blow molded and subjected to testing for stress cracking, top load and. . .

SUMMARY:

BSUM(8)

In . . . a fusion blend of a post consumer plastic and ethylene polymers and comprising post consumer resin of homopolymer high density **polyethylene** resin and a small amount of linear low density **polyethylene** resin. In another form, the container is made from a blend of post consumer homopolymer high density **polyethylene** resin, virgin high density **polyethylene** resin with a small amount of linear low density **polyethylene** resin. The physical properties of the container including stress cracks resistance are maintained as contrasted to the loss of such. . .

DETDESC:

DETD(5)

The plastic resin of the outer layer A may comprise a fusion blend of ethylene copolymers such as linear low density **polyethylene**, low density **polyethylene**, high density **polyethylene**, or mixtures thereof and an appearance enhancing additive.

DETDESC:

DETD(7)

The thin plastic layer B may comprise a fusion blend of ethylene

polymer, preferably virgin high density **polyethylene** or post consumer resin and an appearance enhancing additive which will mask the post consumer resin in the thick layer. . .

DETDESC:

DETD(8)

Post consumer resin contains primarily the plastic from high density **polyethylene** homopolymer containers used for packaging milk and colored plastic containers and possible **polypropylene** resin from syrup bottles, multi-layer ketchup bottles and caps. Such post consumer resin may have the properties set forth in. . .

DETDESC:

DETD(10)

The thin inner layer D, when used, comprises ethylene copolymers such as virgin high density **polyethylene** or linear low density **polyethylene**.

DETDESC:

DETD(13)

The low density **polyethylene** homopolymer comprises utilized in the outer layer has a melt index of at least 2 and preferably less than 1; . . .

DETDESC:

DETD(14)

The low density **polyethylene** comprises the outside high gloss layer. The low density **polyethylene** has melt index of at least 2 and preferably less than 1 and will have a density mzx of 0.93. . . .

DETDESC:

DETD(20)

Thin layer A--glossy high density **polyethylene** and pearlescent additive

DETDESC:

DETD(23)

Thin layer D--virgin high density **polyethylene** and colorant

DETDESC:

DETD(25)

Thin layer A--glossy high density **polyethylene**

DETDESC:

DETD(28)

Thin layer D--virgin high density **polyethylene** and colorant

DETDESC:

DETD(30)

Thin layer A--glossy low density **polyethylene**

DETDESC:

DETD(33)

Thin layer D--virgin high density **polyethylene**

DETDESC:

DETD(37)

Thin layer A--virgin high density **polyethylene**, glossy high density **polyethylene** and linear low density **polyethylene**

DETDESC:

DETD(43)

In this form, the third layer C' comprises post consumer recycled **polyethylene** resin, process trim and offware scrap. An adhesive layer (not shown) is provided between the layer B and layer C' and also between layer C' and layer D' for layer adhesion. This adhesive layer comprises a nylon/**polyethylene** adhesive.

CLAIMS:

CLMS(2)

2. . . . claim 1 wherein said thin outer plastic layer comprises ethylene polymers selected from the group consisting of linear low density **polyethylene**, low density **polyethylene**, high density **polyethylene**, or mixtures thereof.

CLAIMS:

CLMS(3)

3. . . . whereto said thin intermediate plastic layer comprises a fusion blend of post consumer resin primarily the plastic from high density **polyethylene** homopolymer containers used for packaging milk and colorant.

CLAIMS:

CLMS(5)

5. . . . wherein said thin intermediate plastic layer comprises a fusion blend of post consumer resin primarily the plastic from high density **polyethylene** homopolymer containers used for packaging milk and colorant.

CLAIMS:

CLMS(10)

10. . . . layer of post consumer resin and said further inner layer of solvent resistant plastic, each said adhesive layer comprising a nylon/**polyethylene** adhesive.

CLAIMS:

CLMS(11)

11. The plastic container set forth in claim 7 wherein said thin layer overlying said thin layer comprises virgin high density **polyethylene**.

CLAIMS:

CLMS(15)

15. . . . claim 14 wherein said thin outer plastic layer comprises

ethylene polymers selected from the group consisting of linear low density **polyethylene**, low density **polyethylene**, high density **polyethylene**, or mixtures thereof.

CLAIMS:

CLMS (16)

16. . . . in claim 15 wherein said intermediate plastic layer comprises a fusion blend of post consumer resin primarily from high density **polyethylene** homopolymer containers used for packaging milk and colorant.

CLAIMS:

CLMS (18)

18. . . . in claim 15 wherein said intermediate plastic layer comprises a fusion blend of post consumer resin primarily from high density **polyethylene** homopolymer containers used for packaging milk and colorant.

CLAIMS:

CLMS (23)

23. . . . layer of post consumer resin and said further inner layer of solvent resistant plastic, each said adhesive layer comprising a nylon/**polyethylene** adhesive.

CLAIMS:

CLMS (24)

24. The method set forth in claim 20 wherein said thin layer comprises virgin high density **polyethylene**.

=> s 428/903.3/ccls and multilayer? plastic (container or bottle) and polyethylene and (voh or ethylene vinyl alcohol or eval)

MISSING OPERATOR 'PLASTIC (CONTAINER'

=> s 428/903.3/ccls and multilayer? plastic (w) container or bottle) and polyethylene and (voh or ethylene vinyl alcohol or eval)

UNMATCHED RIGHT PARENTHESIS 'BOTTLE) AND'

=> s 428/903.3/ccls and multilayer? plastic (w) (container or bottle) and polyethylene and (voh or ethylene vinyl alcohol or eval)

274 428/903.3/CCLS
32399 MULTILAYER?
451774 PLASTIC
111733 PLASTICS
505436 PLASTIC
(PLASTIC OR PLASTICS)
293 MULTILAYER? PLASTIC
(MULTILAYER? (W) PLASTIC)
220433 CONTAINER
105597 CONTAINERS
249633 CONTAINER
(CONTAINER OR CONTAINERS)
17 BOTTLE
30 MULTILAYER? PLASTIC (W) (CONTAINER OR BOTTLE)
200299 POLYETHYLENE
7280 POLYETHYLENES

201543 POLYETHYLENE
 (POLYETHYLENE OR POLYETHYLENES)
 259 VOH
 193173 ETHYLENE
 905 ETHYLENES
 193341 ETHYLENE
 (ETHYLENE OR ETHYLENES)
 144982 VINYL
 1849 VINYLS
 145617 VINYL
 (VINYL OR VINYLS)
 219310 ALCOHOL
 131596 ALCOHOLS
 252515 ALCOHOL
 (ALCOHOL OR ALCOHOLS)
 2308 ETHYLENE VINYL ALCOHOL
 (ETHYLENE (W) VINYL (W) ALCOHOL)
 868 EVAL
 4 EVALS
 868 EVAL
 (EVAL OR EVALS)
 L5 0 428/903.3/CCLS AND MULTILAYER? PLASTIC (W) (CONTAINER OR BOT
 TTL
 E) AND POLYETHYLENE AND (VOH OR ETHYLENE VINYL ALCOHOL OR E
 VAL
)

=> s 428/903.3/ccls and multilayer? plastic (w) (container or bottle) and polyethylene and (evoh or ethylene vinyl alcohol or eval)

 274 428/903.3/CCLS
 32399 MULTILAYER?
 451774 PLASTIC
 111733 PLASTICS
 505436 PLASTIC
 (PLASTIC OR PLASTICS)
 293 MULTILAYER? PLASTIC
 (MULTILAYER? (W) PLASTIC)
 220433 CONTAINER
 105597 CONTAINERS
 249633 CONTAINER
 (CONTAINER OR CONTAINERS)
 17 BOTTLE
 30 MULTILAYER? PLASTIC (W) (CONTAINER OR BOTTLE)
 200299 POLYETHYLENE
 7280 POLYETHYLENES
 201543 POLYETHYLENE
 (POLYETHYLENE OR POLYETHYLENES)
 1033 EVOH
 10 EVOHS
 1033 EVOH
 (EVOH OR EVOHS)
 193173 ETHYLENE
 905 ETHYLENES
 193341 ETHYLENE
 (ETHYLENE OR ETHYLENES)
 144982 VINYL
 1849 VINYLS
 145617 VINYL
 (VINYL OR VINYLS)
 219310 ALCOHOL
 131596 ALCOHOLS
 252515 ALCOHOL
 (ALCOHOL OR ALCOHOLS)
 2308 ETHYLENE VINYL ALCOHOL
 (ETHYLENE (W) VINYL (W) ALCOHOL)

868 EVAL
4 EVALS
868 EVAL
(EVAL OR EVALS)
L6 0 428/903.3/CCLS AND MULTILAYER? PLASTIC (W) (CONTAINER OR BOT
TTL
E) AND POLYETHYLENE AND (EVOH OR ETHYLENE VINYL ALCOHOL OR
EVA
L)

=> s 428/903.3/ccls and multilayer? plastic (w) (container or bottle) and
polyethylene and fluorin? polyethylene

274 428/903.3/CCLS
32399 MULTILAYER?
451774 PLASTIC
111733 PLASTICS
505436 PLASTIC
(PLASTIC OR PLASTICS)
293 MULTILAYER? PLASTIC
(MULTILAYER? (W) PLASTIC)
220433 CONTAINER
105597 CONTAINERS
249633 CONTAINER
(CONTAINER OR CONTAINERS)
17 BOTTLE
30 MULTILAYER? PLASTIC (W) (CONTAINER OR BOTTLE)
200299 POLYETHYLENE
7280 POLYETHYLENES
201543 POLYETHYLENE
(POLYETHYLENE OR POLYETHYLENES)
78162 FLUORIN?
200299 POLYETHYLENE
7280 POLYETHYLENES
201543 POLYETHYLENE
(POLYETHYLENE OR POLYETHYLENES)
158 FLUORIN? POLYETHYLENE
(FLUORIN? (W) POLYETHYLENE)
L7 0 428/903.3/CCLS AND MULTILAYER? PLASTIC (W) (CONTAINER OR BOT
TTL
E) AND POLYETHYLENE AND FLUORIN? POLYETHYLENE

1. 5,693,283, Dec. 2, 1997, Container with **recycled** plastic; Gregory M. Fehn, 264/513; **215/12.1**; 264/512, 515, 918; 428/36.6, 36.7 [IMAGE AVAILABLE]
2. 5,688,570, Nov. 18, 1997, Method and apparatus for forming a multi-layer preform; Frank A. Ruttinger, Sr., 428/35.7; **215/12.2**; 264/513, 515, 537, 539; 425/500, 522, 525, 532; 428/36.91, 167, 213, 542.8 [IMAGE AVAILABLE]
3. 5,676,267, Oct. 14, 1997, Multi-layer containers; William A. Slat, et al., **215/12.1**; 220/454; 264/513, 515 [IMAGE AVAILABLE]
4. 5,645,183, Jul. 8, 1997, Multi-layer containers; William A. Slat, et al., **215/12.2**, **12.1**, 374; 220/454 [IMAGE AVAILABLE]
5. 5,688,572, Nov. 18, 1997, Multi-layer containers; William A. Slat, et al., 428/36.91; **215/12.2**; 428/35.7, 36.7, 36.9, 213, 542.8, 903.3 [IMAGE AVAILABLE]
6. 5,464,106, Nov. 7, 1995, Multi-layer containers; William A. Slat, et al., **215/12.1**, 373; 220/454; D9/520 [IMAGE AVAILABLE]

=> d 2- ab

US PAT NO: 5,688,570 [IMAGE AVAILABLE]

L3: 2 of 6

ABSTRACT:

A preform mold assembly for the injection molding of a multi-layer preform for use in the blow molding of container. The preform mold assembly comprises a preform mold having a gate for receiving molten plastic material. The preform mold has a cavity with longitudinal axis and defines an inner surface. A core-pin is situated within the cavity and spaced from said inner surface. A preform cavity is formed between the inner surface of the cavity and the core-pin for receiving molten plastic from the gate. A threadsplit portion is situated within the cavity at a location remote from said gate. The inner surface of the cavity defines a plurality of flutes formed generally parallel to the cavity longitudinal axis and extend longitudinally along the inner surface of the mold to the threadsplit portion.

US PAT NO: 5,676,267 [IMAGE AVAILABLE]

L3: 3 of 6

ABSTRACT:

A multi-layer preform for forming multi-layer containers includes an extruded inner barrier layer containing polyethylene naphthalate, said inner layer having an upper portion adapted to be formed into an upper portion of a container, an intermediate portion adapted to be formed into an intermediate portion of a container, an extruded and a base portion adapted to form a base portion of a container. The preform includes an outer injection molded layer. The inner layer has a thickness which differs from the base portion to the upper portion.

US PAT NO: 5,645,183 [IMAGE AVAILABLE]

L3: 4 of 6

ABSTRACT:

A container including an upper wall portion formed from at least an inner

layer and an outer layer of material wherein the inner layer of material has a first thickness at the upper wall portion. The container also includes an intermediate side wall portion formed from at least the inner and the outer layer of material. The inner layer of material has a second thickness at the intermediate side wall portion which is thinner than the first thickness at the upper wall portion and the intermediate side wall portion is positioned beneath the upper wall portion. The container also includes a self-supporting base wall portion formed from at least the inner layer and the outer layer of material. The inner layer of material has a third thickness at the self-supporting base wall portion thicker than the second thickness at the intermediate side wall portion and the self-supporting base wall portion is positioned beneath the intermediate side wall portion and adapted to support the container.

US PAT NO: 5,688,572 [IMAGE AVAILABLE]

L3: 5 of 6

ABSTRACT:

A multi-layer preform for forming multi-layer containers includes an extruded upper portion having a first thickness which is adapted to form an upper portion of a container. The preform also includes an extruded intermediate portion having a second thickness thicker than the first thickness. The intermediate portion is connected with the upper portion and is adapted to form an intermediate body portion of the container. The preform also includes an extruded base portion having a third thickness thicker than the second thickness. The base portion is connected with the intermediate portion and is adapted form a base portion of the container. The portions of the preform are preferably formed from an inner layer and a barrier layer wherein the layers are co-extruded for forming the preform and an outer injection molded layer. In one embodiment, the inner layer includes a lip which overlaps the top edge of the barrier and outer layers. A multi-layer container is then formable from blow molding the preform.

US PAT NO: 5,464,106 [IMAGE AVAILABLE]

L3: 6 of 6

ABSTRACT:

A multi-layer preform for forming multi-layer containers includes an extruded upper portion having a first thickness which is adapted to form an upper portion of a container. The preform also includes an extruded intermediate portion having a second thickness thicker than the first thickness. The intermediate portion is connected with the upper portion and is adapted to form an intermediate body portion of the container. The preform also includes an extruded base portion having a third thickness thicker than the second thickness. The base portion is connected with the intermediate portion and is adapted form a base portion of the container. The portions of the preform are preferably formed from an inner layer and a barrier layer wherein the layers are co-extruded for forming the preform and an outer injection molded layer. In one embodiment, the inner layer includes a lip which overlaps the top edge of the barrier and outer layers. A multi-layer container is then formable from blow molding the preform.